REMARKS

This amendment is responsive to the Office Action of September 21, 2007. Reconsideration and allowance of the claims 1-19 are requested.

The Office Action

Claims 1-8 stand rejected under 35 U.S.C. § 102 as being anticipated by Zhang ("Improving True-FISP Parallel Cine Imaging Using a New Data-Acquisition Scheme for Coil Sensitivity Calibration", 2003, Proc. Intl. Soc. Mag. Reson. Med.; 11:2329).

The Prior Art

Zhang discloses a SMASH cardiac imaging technique in which a steady-state preparation is applied before image acquisition. More specifically, the steady-state preparation is a single-shot true FISP sequence.

The Claims Are in Condition For Allowance

Claim 1 calls for a calibration sequence which includes one of a spin-echo type sequence or a gradient echo type sequence. By contrast, Zhang uses a steady-state, particularly a FISP, calibration sequence.

Moreover, claim 1 calls for the in-plane phase encode direction of the calibration and parallel imaging sequences to match. The direction of the phase encode directions in Zhang is not addressed.

Claim 4 calls for the calibration sequence to include the gradient echo type calibration sequence using an echo time less than 5 ms. This short echo time is significant in that it reduces accumulated phase errors. Zhang, by contrast, does not use a gradient echo type calibration sequence, preferring a FISP steady-state sequence, and makes no suggestion of echo times of 5 ms or less.

Claim 5 calls for an essentially identical read out gradient to be used in both the calibration sequence and the parallel imaging sequence. Zhang does not disclose using a common read out gradient in the FISP type calibration sequence and the SMASH image acquisition sequence.

Claim 6 calls for a phase encode direction of the calibration sequence to be essentially directed along a phase encode direction of the parallel imaging sequence. Zhang does not address whether the calibration and image acquisition sequences have phase encoding along a same or a different direction.

Accordingly, it is submitted that **claim 1 and claims 2-7 and 17-19 dependent therefrom** are not anticipated by Zhang.

Claim 8 is directed to an MRI apparatus that includes an open magnet system and uses a spin echo calibration sequence. Open magnets tend to suffer more significant gradient rollover issues than bore-type magnets. Zhang uses a 1.5T magnetom sonata system which is a 1.5T bore-type system. Further, Zhang uses a steady-state preparation sequence, not a spin echo calibration sequence. Accordingly, it is submitted that **claim 8 and new claims 9-12 dependent therefrom** are not anticipated by Zhang and distinguish patentably and unobviously thereover.

New **claim 13** calls for a calibration technique which includes a series of spin echoes which are phase encoded in the same direction as the selected phase encoding for the parallel imaging sequence to follow. Zhang uses a steady-state preparation sequence and makes no suggestion of using spin echoes and does not address the phase encoding direction.

Claim 14 calls for the calibration sequence to use the same read out gradient as will be used in the selected parallel imaging sequence to follow. Zhang does not address read out gradients and makes no suggestion that read out gradients for the described steady state preparation sequence should be the same as read out gradients in his SMASH imaging sequence.

Accordingly, it is submitted that **claim 13 and claims 14-16 dependent therefrom** are not anticipated by Zhang and distinguish patentably and unobviously over the references of record.

CONCLUSION

For the reasons set forth above, it is submitted that all claims distinguish patentably over the references of record and meet all statutory requirements. An early allowance of claims 1-19 is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, she is requested to telephone Thomas Kocovsky at (216) 861-5582.

Respectfully submitted,

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